

Plastic belt rollers for food production

Achieve enhanced food safety, reduced maintenance,
and cost savings in food processing

Introduction & background

Belt rollers are an essential component in the food industry. They are relevant for various segments of food processing, from the meat and fish industry to bakery production. The functionality of belt rollers is based on their ability to safely guide conveyor belts, even at high speeds, so as to transfer the goods from one belt to another. This is particularly important at transitions where space is limited.

The food industry places high demands on processing technology to optimize and guarantee both product quality and food safety. In this context, the belt rollers are of major importance. They allow for safe transitions between belts and help reduce waste and improve production speed.

This white paper is dedicated to shedding light on the various aspects of tribologically optimized plastic belt rollers in the food industry. After an introduction to the basic meaning and advantages of plastic belt rollers, the technology, advantages, quality control measures, and a cost-benefit analysis are discussed in detail. Finally, case studies and practical examples are presented, which demonstrate the successful use of these rollers.

Technology of knife edge rollers

Choice of material

Selecting the best material for belt rollers is fundamental in order to fulfill the specific requirements of the food industry. In this context, wear resistance, temperature resistance, chemical resistance, and hygiene standards are decisive factors. The iglide plastics listed below fulfill all standards of the food industry and can be used without hesitation.

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iglide® A180

The material is FDA-compliant and has been specifically developed for use in the food and beverage industry. It has good wear resistance, low moisture absorption, and withstands temperatures of up to 194°F (90°C).

iglide® A181

This material complies with FDA and EU 10/2011 requirements. The blue color also facilitates the “optical detectability” often desired in the food sector. iglide A181 is comparable to A180 in terms of mechanical specifications, temperature and media resistance, and even better in terms of wear resistance in most applications.

iglide® A250

This is another FDA-compliant material that is characterized by excellent sliding properties on stainless-steel shafts. It was specifically developed for high belt speeds and is very wear-resistant at short-term operating temperatures of up to 356°F (180°C).

iglide® A350

This material is also FDA-compliant and even fulfills the fire protection requirements of the US Federal Aviation Administration (FAA). Its long-term application temperature is 356°F (180°C), but it can withstand up to 410°F (210°C) for short periods.

iglide® H1

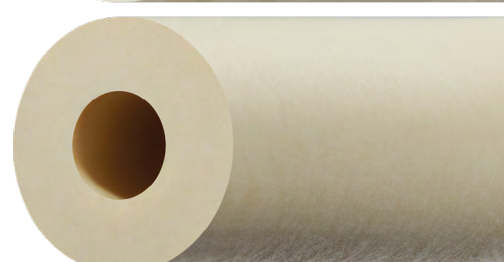
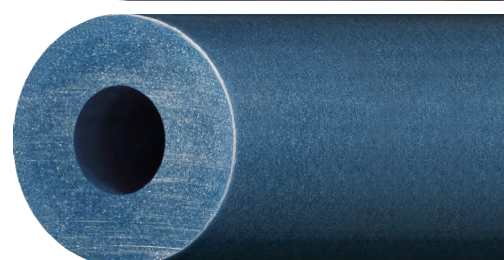
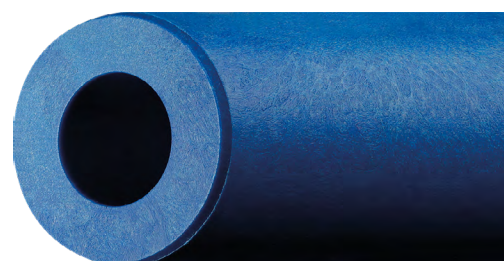
This is the first choice when long service lives are required under extreme environmental conditions. Extreme wear resistance is combined with excellent resistance to temperature, media, and chemicals, which makes it suitable for packaging, food technology, and automotive engineering, among other applications.

iglide® W301

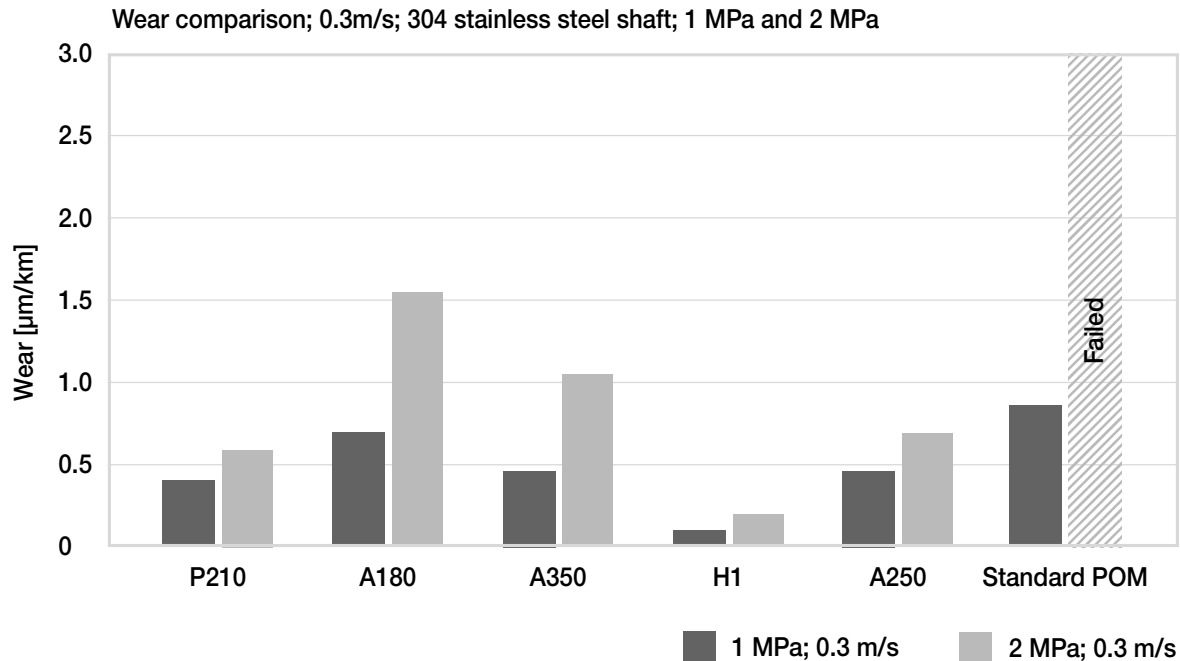
This versatile, wear-resistant material offers the lowest wear rate of all roller materials at a continuous operating temperature of 194°F (90°C). It is up to six times more wear resistant than iglide H1.

iglide® P210

With a low coefficient of wear on almost all shafts, this material is the best solution for pivoting and rolling applications at continuous operating temperatures of 212°F (100°C).



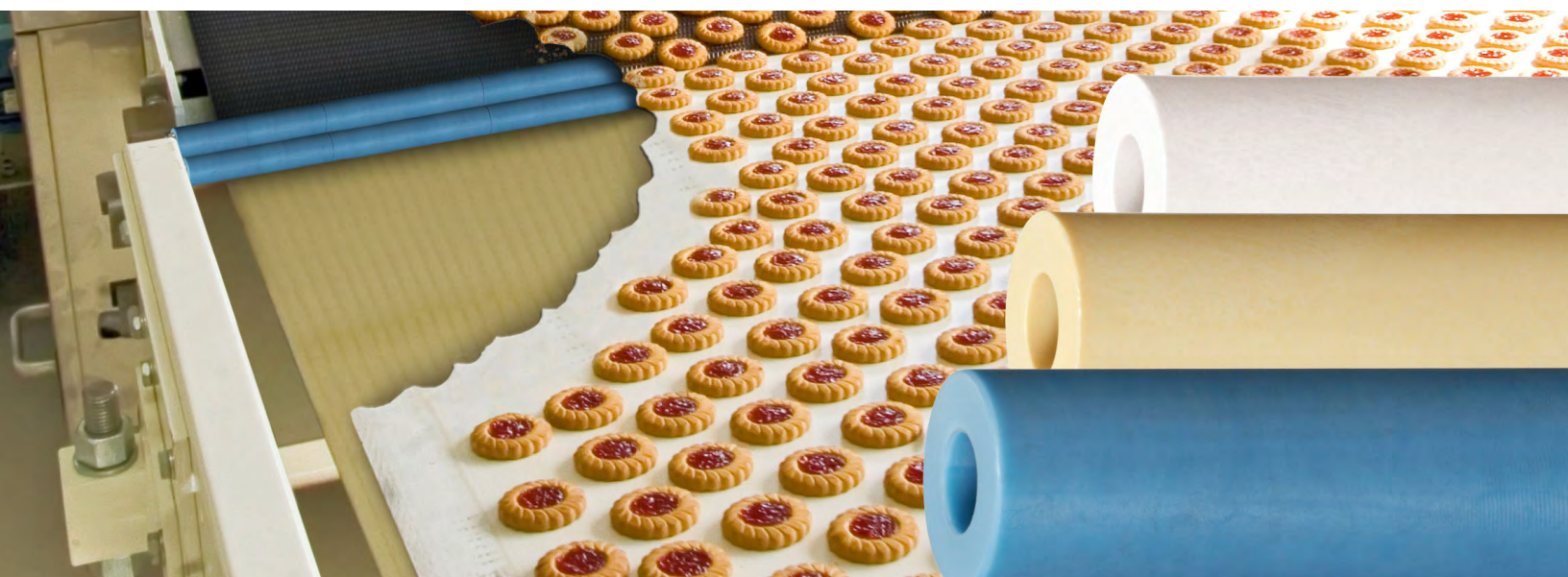
Wear results from the industry's largest test laboratory



Source: igus

Hygiene requirements

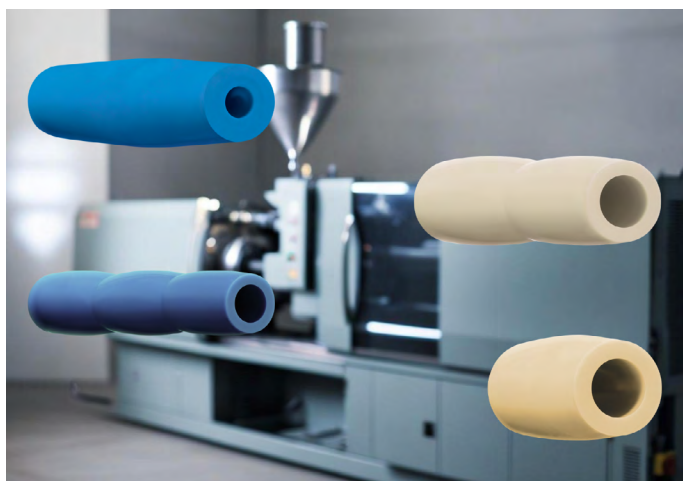
In the food industry, compliance with the highest hygiene standards is of the utmost importance. Therefore, belt rollers must be designed in such a way that they are easy to clean and comply with strict food-processing regulations. Rounded edges and smooth surfaces minimize the accumulation of residue.



Adaptability

A special feature of belt rollers is their ability to adapt to different belt speeds and loads. This allows for flexible use in different production lines without compromising on efficiency or safety.

In addition, igus offers custom parts manufacturing, making belt rollers available in individual lengths or shapes for particular applications. Custom rollers can be produced via injection molding, or machined from bar stock with the help of the online [CNC parts configurator](#).



Production via injection molding
Source: igus



Online CNC service
Source: igus

New products & further developments

The continuous development of technologies has led to the introduction of new materials and designs that exceed previous performance standards. One example is the use of self-lubricating materials such as the previously mentioned high-performance iglide plastics, which reduce maintenance costs. Behind the scenes, igus is always working with the latest test data to improve existing materials and develop new products that can improve customer designs and further reduce costs.

Advantages

of igus® knife edge rollers

The use of belt rollers in the food industry has numerous advantages:

For particularly tight belt deflection

Belt rollers are ideal for tight deflection radii, which makes them extremely flexible in various production lines.

Maintenance-free & dry-running

Our belt rollers require no additional lubrication. They are made of dry-running materials that make maintenance almost completely unnecessary.

No production contamination caused by lubricants

There is no risk of food contamination as no external lubricants are required.

Durable & wear-resistant

The use of high-quality materials ensures a long service life and high wear-resistance of the rollers.

Hygienic design without ball or needle rollers

The design without ball or needle rollers makes cleaning easier and ensures the highest standards of hygiene.

Suitability for direct food contact possible

Many of our materials are approved for direct contact with food and comply with regulations such as FDA, EU 10/2011, and the Japan Food Safety Act.

Resistance to temperature & chemicals

Our product range includes belt rollers that are resistant to high temperatures and aggressive chemicals.

Cost-benefit analysis

The implementation of belt rollers in the food industry is not only associated with technical and qualitative advantages, but can also offer significant benefits from an economic point of view. The relevant aspects of a cost-benefit analysis are highlighted below, offering buyers a sound basis to make decisions.

Acquisition costs

The acquisition costs for belt rollers depend on various factors, including material, size, and manufacturer. High-quality materials such as iglide are associated with higher acquisition costs, but have a longer service life and require less maintenance.

Maintenance & operation

Self-lubricating materials significantly reduce the need for regular maintenance. This helps operators save maintenance costs, minimizes production line downtime, and eliminates costs for the procurement and disposal of lubricants.

Service life & reliability

The long service life of belt rollers means that replacement cycles are reduced, which lowers direct costs for spare parts and indirect costs of production downtime. The high wear resistance ensures consistent performance of the conveyor belts, which prevents production delays and quality defects.

Enhanced efficiency

The smooth operation of the belt rollers leads to an increase in production speed. This results in a higher output, which in turn leads to a reduction in unit costs. Narrow deflection radii allow for a more compact design of the production systems, which saves space and, if necessary, helps save further costs due to reduced space requirements.

Hygiene benefits

The hygienic design of the rollers helps reduce time spent on cleaning and ensures compliance with strict hygiene standards. This is essential for avoiding contamination and product recalls, which can result in considerable financial losses.

Long-term investment security

Compliance with international standards ensures that the components used are future-proof and do not need to be adjusted in different markets.



Case studies

and practical examples

This section presents specific practical examples that demonstrate the successful use of belt rollers in the food industry. These case studies are designed to give buyers insight into real-world application possibilities and benefits.

Case study 1:

Bakery enterprise

Challenge: A large bakery enterprise was faced with the problem of conventional conveyor belts that did not work reliably at high production speeds and frequently broke down.

Solution: By implementing belt rollers made of iglide A250, the company achieved a significant improvement in

production speed and reliability. The rollers allowed tight deflection radii and significantly reduced maintenance costs.

Result: Production downtime was reduced by 30%, maintenance costs fell by 20%, and overall productivity increased by 15%.



Case study 2: Meat processing plant

Challenge: In a meat processing plant, conventional rollers introduced the risk of contamination and were difficult to clean.

Solution: FDA-compliant belt rollers made of iglide A181 allowed for a more hygienic processing line. The dry-running properties of the rollers eliminated the risk of product contamination from lubricants.

Result: Time spent on cleaning was reduced by 25% and there were no more incidents of contamination. This led to improved food safety and compliance with hygiene standards.



Case study 3: Fish processing plant

Challenge: A fish processing plant had difficulties when subjecting its rollers to salty environments and low temperatures.

Solution: The company solved this problem by switching to belt rollers made of iglide H1. Their high resistance to aggressive media and extreme temperatures ensured smooth operation even under demanding conditions.

Result: The service life of the rollers doubled and the production line operated without interruptions, resulting in cost savings of 18%.





Case study 4: **Chocolate manufacturer**

Challenge: At a chocolate manufacturer, high temperatures in certain production processes were causing problems with the stability of conveyor rollers.

Solution: By using belt rollers made of iglide A350, which are suitable for temperatures of up to 356°F (180°C), these challenges could be met.

Result: Production was more reliable and there was no deformation or wear of the rollers despite the high temperatures. This led to an increase in production quality and a reduction in the reject rate of products by 10%.

Questions
about belt rollers from igus?

Get started with an
igus expert today!





Conclusion

The integration of tribologically optimized plastic belt rollers, particularly the iglide range, presents a significant advancement for the food industry. These rollers meet high demands for product quality and food safety by offering features like dry-running, hygienic design, and compliance with strict standards (e.g., FDA, EU 10/2011).

The documented case studies across bakery, meat, fish, and chocolate manufacturing demonstrate tangible benefits, including reduced maintenance, decreased downtime, improved hygiene, and enhanced efficiency, showcasing their strong economic and operational value as a long-term investment. By reducing contamination risk and eliminating external lubricants, these rollers also contribute to a better ecological footprint for production units.